

COAST GUARD (CG-5214) APPROVAL GUIDE LINES

FOR

RELEASE MECHANISM

This checklist is based on the USCG Guidelines for approval dated January 1995, but updated to address the adoption of the IMO Lifesaving Appliances (LSA) Code, which became effective in 1998. The procedures in 46 CFR 159.005 are used to for approval of release mechanisms.

REQUIREMENTS	MANUFACTURER COMMENTS	COAST GUARD REVIEW
DRAWING LIST	(List Dwg # or document where applicable information can be found)	
Document that lists all drawings, specifications, manuals, and any other documentation submitted for approval that includes: - each document number, - revision issue/date, and - title Critical subassemblies and components which must be included:	(This section is primarily to check whether a document is provided) No Dwg #s required in this block.	
General: Layout of release console/handle & interlock(s) (helmsman's console) Recommended release gear installation, connection details		
GENERAL ARRANGEMENT	(Dwg # / Doc # requested in {all/most} blocks below)	
(1) General arrangement drawing including principal dimensions;		
(2) Stress calculations for all load carrying parts including the release hooks, release mechanisms, and connections;		

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(3) Sufficient detail to show that the release mechanism meets the requirements of Guideline 33--Release Mechanism for Lifeboats and Rescue Boats (SOLAS);

(4) An instruction and maintenance manual with safety procedures; and

CONSTRUCTION DETAILS

(Dwg List reference may be sufficient)

Detail drawing of all unique parts including --

(iv) Fabrication details for each major structural component, including details of each welded joint;

Materials used on all parts, referenced to a U.S. national standard or equivalent

(ii) Welders qualifications, welding procedure, and materials used

CONTROL STATION

(a) All release mechanisms. Each release mechanism manufactured under this guideline must meet the following requirements in complying with paragraphs 1.2 and 4.4.7.6 of the LSA Code and be designed to be operated by persons wearing immersion suits.
(See note below.)

Note: It is recommended that standard human engineering practices as described in ASTM F 1166 be followed in the design of each release mechanism. Design limits should be based on a range from the fifth percentile female to the ninety-fifth percentile male values for critical body dimensions and functional capabilities as described in ASTM F 1166. The dimensions for a person wearing an immersion suit correspond to the arctic clothed dimensions of ASTM F 1166.

(1) LSA Code Paragraph 1.2.1. Each major structural component of each release mechanism must be constructed of steel. Other materials may be used if accepted by the Commandant (G-MSE) as equivalent or superior.

(i) Steel. Sheet steel and plate must be low carbon, commercial quality, either corrosion resistant or galvanized as per ASTM A 525, coating designation G115. Structural steel plates and shapes must be carbon steel as per ASTM A 36. All steel products, except corrosion resistant steel, must be galvanized to provide high quality zinc coatings suitable for the intended service life in a marine environment. Each fabricated part must be galvanized after fabrication. Corrosion resistant steel shall be a standard 302 stainless steel or have equal or superior corrosion resistant characteristics.

(ii) Welding. Welding must be performed by welders qualified by the Commandant (G-MSE), American Bureau of Shipping, U.S. Navy, or a Coast Guard accepted independent laboratory. Only electrodes intended for use with the material being welded may be used. All welds must be checked using appropriate non-destructive tests.

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(2) LSA Code Paragraph 1.2.4. Metals in contact with each other must be either galvanically compatible or insulated with suitable non-porous materials such as plastic, rubber, or neoprene based compounds, micarta, or equivalent materials. Provisions must also be made to prevent loosening or tightening resulting from differences of thermal expansion, freezing, buckling of parts, galvanic corrosion, or other incompatibilities.

(3) LSA Code Paragraph 4.4.7.6.2. An illustrated operating instruction plate or placard, showing the release and recovery procedures must be supplied with the release gear. The plate or placard must be corrosion resistant and weatherproof and must be marked with the signal word DANGER. The release gear and its components must be labeled, as required, to aid in understanding and operation of the system. The illustrated operating instruction and DANGER notice and label wording must correspond exactly to that used in the instruction and maintenance manual provided by the manufacturer.

(4) LSA Code Paragraph 4.4.7.6.2.3. The release lever or control must be red in color, and the area immediately surrounding the control must be a sharply contrasting light color.

(5) LSA Code Paragraph 4.4.7.6.2.4.

(i) Each load carrying part of the release mechanism, including its connection to the boat must be designed with a safety factor of 6 based on the ultimate strength of the materials used. To calculate the load on a dual hook suspension, the mass of the boat can be assumed to be evenly distributed.

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(iii) Positive means of lubrication must be provided for each bearing which is not permanently lubricated. Points of lubrication must be so located that they are clearly visible and accessible in the installed position in the boat.

(iv) A hydraulic system, if used to activate the release mechanism must be in accordance with 46 CFR 58.30. If a hand pump is provided, adequate space must be provided for the hand pump or hand operation.

(b) Release mechanism for a davit launched boat. Each release mechanism for a davit launched boat must meet the following specific requirements in complying with LSA Code Paragraph 4.4.7.6.

(1) The release hooks must prevent the falls from slipping out in the off-load condition before the release gear is operated.

(i) The on-load release mechanism must be designed to function when the fully loaded boat is being towed through the water on its falls, at speeds of up to 5 knots.

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(ii) (LSA Code Paragraph 4.4.7.6.2.2) To prevent a premature on-load release, the release mechanism design must incorporate a special mechanical protection not normally required for off-load release. In addition, the on-load operation of the release mechanism must require two separate deliberate actions by the operator.

Where a single fall and hook system is used for launching a lifeboat or rescue boat in combination with a suitable painter, the requirements of paragraph 4.4.7.6.2 (of the LSA Code) need not be applicable; in such an arrangement a single capability to release the lifeboat or rescue boat, only when it is fully waterborne, will be adequate.

(iii) To prevent an accidental release during recovery of the boat, the release hooks must not be able to carry any weight until the release mechanism is properly reset. The mechanical protection required by LSA paragraph 4.4.7.6.2.2 must only be able to be engaged when the release mechanism is properly and completely reset. Proper engagement of the mechanical protection must be visually indicated.

(c) Release mechanism for a boat arranged for free-fall launching.

(1) Be able to release the boat under any condition of loading from empty to 200% of the approved working load of the release mechanism.

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(2) Have two independent activation systems which can only be operated from inside the boat. Each activation system must require at least two independent actions from different locations inside the boat to release the hook.

(3) Have mechanical protection against accidental or premature release which can only be engaged when the release mechanism is properly and completely reset. Proper engagement of the mechanical protection must be visually indicated.

(4) Not be able to carry any weight until the release mechanism is properly reset.

(5) Be designed to test the release system without launching the boat.

APPROVAL INSPECTIONS AND TESTS

(33-11 Approval inspections and tests.)

(See IMO **STANDARDIZED LIFE-SAVING APPLIANCE EVALUATION AND TEST REPORT FORMS**)

(2) Operation. Operation of the off-load control, for a davit-launched boat, must be tested to confirm that the release lever cannot be shifted to release the boat in either the full load or light load condition. The operation of the hook release, for a free-fall boat, shall be demonstrated using both activation systems and may be tested without launching the boat.

(3) Materials Steel meeting ASTM A 525 shall be confirmed to have met the coating mass and bend tests requirement specified under ASTM A 525 after galvanizing or other anti-corrosion treatment has been applied. This compliance can be ascertained through supplier's certification or by conducting actual tests.

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(4) Tensile tests. The release mechanism hook assembly and supporting structure shall be tensile tested in a jig built to load the hook assembly in the same way it would be loaded when installed in a boat. The hook assembly will be approved for a maximum of one-sixth of the highest load applied.

(5) Universal joints. This test is required if the release mechanism employs universal joints to transmit the release power from the control to the hook release. One of each type and size of universal joint shall be set up in a jig with the angles of leads set at 0, 30 and 60 degrees respectively. A torque of 540 Nm (400 ft lb) shall be applied. This torque shall be applied with the connecting rod secured beyond the universal and with the lever arm in the horizontal position. There must be no permanent set, or undue stress as a result of this test.

(6) Hydraulic controls. This test shall be in accordance with 46 CFR 58.30-35 and is required if the release mechanism employs fluid control to transmit the release power from the control to the hook release. (Note lifeboat checklist)

QUALITY SYSTEM

(33-13 Quality control and conformance on production units.)

(a) Manufacturer's responsibility. The manufacturer shall:

(1) Institute a quality control procedure to ensure that all production units are produced to the same standard, and in the same manner as the prototype release gear approved by the Commandant (G-MSE). The manufacturer's quality control personnel shall not work directly under the department or person responsible for either production or sales.

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- Ensure that all required tests are performed.

Quality control procedures

- inspections / quality teams
- inventory control
- welding inspection/control

Record keeping

- material certifications

PLACARDS AND LABELS



(33-15 Marking and labeling.)

The required markings and labels must be in English.
Additional languages are permitted.

(a) A corrosion-resistant nameplate must be permanently affixed to each release mechanism. The following must be permanently marked on the nameplate:

- (1) Name and address of the manufacturer;
- (2) Approved working load, model designation and serial number of the release mechanism;
- (3) Name and address of the independent laboratory or inspecting agency;
- (4) U.S. Coast Guard approval number and the words "SOLAS"; and
- (5) Year of manufacture.

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(b) Each label, caution and danger notice and each operating, maintenance, or general instruction, should meet ASTM F 1166, Sections 27, 28, 29, 30, and 31, in terms of format, content, lettering size and spacing, color, and posted location. Each label must be illustrated with symbols in accordance with Resolution A.760(18), as applicable.

Recommended illustrated operating instructions, showing the applicable release and recovery procedures to be posted so as to be visible and legible from the normal operating position. The instructions must be marked with the signal word DANGER.

The release gear and its components must be labeled, as required, to aid in understanding and operation of the system.

Drawings of recommended "Hazard" and "Instruction" signs, showing actual inscription, format, color, size, and location.

MANUALS

(33-17 Operation, maintenance and training manual.)

The manufacturer shall make an operation and maintenance manual available to purchasers of approved release mechanisms to enable vessel operators to meet Regulations III/20.3, 35, and 36 of SOLAS 74/83.

(a) The material must include a complete discussion of operation, maintenance, and safety procedures to be followed in the use of release mechanisms and associated components and equipment.

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(b) The material presented must be clear, sufficiently detailed, and unambiguous. The material must be in English though additional languages are acceptable. Wherever possible, the material must be-

- (1) Explained with the help of diagrams;
- (2) Presented in short numbered paragraphs; and
- (3) Written in the active voice.

The training manual, which may be combined with the operation and maintenance manual, shall contain instructions and information, in easily understood terms illustrated wherever possible, on the release mechanism. Any part of such information may be provided in the form of audiovisual aids in lieu of the manual. The following shall be explained in detail:

- use in launching the survival craft / rescue boats;
- use for launching from within the craft;
- release from launching appliances;
- use in recovery of survival craft / rescue boats including stowage and securing, if applicable;
- instructions for emergency repair.

Instructions for onboard maintenance of release mechanisms shall be easily understood, illustrated wherever possible, and, as appropriate, shall include the following:

- a checklist for use when carrying out the inspections required by regulation 20.7;
- maintenance and repair instructions;
- schedule of periodic maintenance;
- diagram of lubrication points with the recommended lubricants;
- list of replaceable parts;

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list of sources of spare parts;
log for records of inspections and maintenance.